

90 seconds (mt=90), the measured values are less than or equal to the applicable short test standards as described in paragraph (d)(4) of this section.

(iii) The vehicle fails the idle mode and the test is terminated if none of the provisions of paragraphs (f)(2) (i) and (ii) of this section is met by an elapsed time of 90 seconds (mt=90).

(g) *High-speed mode.* This mode follows immediately upon termination of the idle mode.

(1) The mode timer resets (mt=0) when the vehicle engine speed is between 2200 and 2800 rpm. If engine speed falls below 2200 rpm or exceeds 2800 rpm for more than two seconds in one excursion, or more than six seconds over all excursions within 30 seconds of the final measured value used in pass/fail determination, the measured value is invalidated and the mode continued. If any excursion lasts for more than ten seconds, the mode timer resets to zero (mt=0) and timing resumes. The minimum high-speed mode length is determined as described in paragraph (g)(2) of this section. The maximum high-speed mode length is 90 seconds elapsed time (mt=90).

(2) The pass/fail analysis begins after an elapsed time of ten seconds (mt=10). A pass or fail determination is made for the vehicle and the mode terminated as described in paragraphs (g)(2)(i) through (iii) of this section.

(i) The vehicle passes the high-speed mode and the mode is terminated at the end of an elapsed time of 30 seconds (mt=30) if the measured values are less than or equal to the applicable short test standards as described in paragraph (d)(4) of this section.

(ii) The vehicle passes the high-speed mode and the mode is immediately terminated if, at any point between an elapsed time of 30 seconds (mt=30) and 90 seconds (mt=90), the measured values are less than or equal to the applicable short test standards as described in paragraph (d)(4) of this section.

(iii) The vehicle fails the high-speed mode and the test is terminated if none of the provisions of paragraphs (g)(2) (i) and (ii) of this section is met by an elapsed time of 90 seconds (mt=90).

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§ 86.1438 Test run—EPA.

(a) This section describes the test run performed by the Administrator for confirmatory testing pursuant to issuing a certificate of conformity under the provisions of § 86.091-29. The Administrator may also employ this procedure for Selective Enforcement Audit and recall purposes. For recall program testing, in-use vehicles will be set to manufacturer's specifications prior to conduct of the CST. The test run consists of the wait time, vehicle preconditioning, and the selected test procedure. The test run is performed in accordance with the conditions in the option selected from table O-96-2 of § 86.1430. If the CST is performed in conjunction with other confirmatory testing in accordance with § 86.1432(b)(2) and (c)(2), the vehicle must undergo the CST at the same specified ambient temperature range as that of the other confirmatory testing performed immediately prior to the optional vehicle soak, except as specified in paragraphs (a) (1) and (2) of this section.

(1) If the transient confirmatory testing was performed at the moderate temperature range specified in § 86.1430 and utilized Otto-cycle test fuel, it may optionally be followed by a CST sequence as described in § 86.1432 (b) and (c) at the warm ambient temperature range.

(2) If the transient confirmatory testing was performed at the moderate temperature range specified in § 86.1430 and utilized Cold CO test fuel, it may optionally be followed by a CST sequence as described in § 86.1432 (b) and (c) at the moderate ambient temperature range, except that if the ambient temperature exceeds 80 °F (27 °C) at any point for the remainder of the sequence from the wait time forward, a non-passing test result renders the test void.

(b) *Wait time.* (1) If the vehicle is not already idling, the vehicle is started and allowed to idle freely with the transmission in neutral. The vehicle wait time begins when the vehicle engine speed is between 350 and 1100 rpm. The specified idle speed range must be attained within ten seconds of beginning the idle operation. A timer for the wait time portion of the test run will initiate (wt=0) when it returns to idle

after any transient operation that occurs immediately prior to the wait time, as described in § 86.1432, or when the vehicle is restarted after being shut off prior to the wait time.

(2) Following the first three minutes of idle, this wait time may be interrupted by vehicle engine off/restart cycles occurring no more frequently than every five minutes, with each engine off period having a maximum duration of two minutes. Each period of idle following a restart must be a minimum of three minutes in duration. During each idle period, the engine speed must not exceed 1100 rpm or fall below 350 rpm for more than five seconds in any one excursion, except during the allowable engine-off periods. The total duration of the wait time, including time at idle and time during engine off periods, is three to 30 minutes.

(c) *Preconditioning.* Immediately following the wait time, the vehicle is preconditioned by increasing engine speed to 2500 \pm 300 rpm for a minimum of 30 seconds, or, optionally, the vehicle will undergo loaded operation for a minimum of 30 seconds between the speeds of 30 and 50 mph (48 to 80 kph).

(d) Immediately following the preconditioning described in paragraph (c) of this section, the test procedure as described in paragraphs (e) through (g) of this section is performed on the test vehicle. When the CST—Loaded Test as described in § 86.1439(d) is selected, the appropriate changes to dynamometer power absorption and inertia weight settings must be completed and the test sequence resumed as soon as possible following completion of preconditioning. The general requirements described in paragraphs (d) (1) through (4) of this section apply.

(1) *Exhaust gas sampling algorithm.* The analysis of exhaust gas concentrations begins ten seconds after the applicable test mode begins. Exhaust gas concentrations must be analyzed at a minimum rate of once every 0.75 second. The measured value for pass/fail determinations is a simple running average of the measurements taken over five seconds.

(2) *Void test conditions.* The test immediately terminates and any exhaust gas measurements are voided if the measured concentration of CO plus CO₂

falls below six percent or the vehicle's engine stalls at any time during the test sequence.

(3) *Multiple exhaust pipes.* Exhaust gas concentrations from vehicle engines equipped with multiple exhaust pipes must be sampled simultaneously.

(4) *Pass/fail determination.* For certification and Selective Enforcement Audit testing, a pass or fail determination is made for each applicable test mode based on a comparison of the measured value for HC and CO as described in paragraph (d)(1) of this section with the short test standards contained in § 86.096-8(a) for light-duty vehicles or in § 86.096-9(a) for light-duty trucks. For recall testing, a pass or fail determination is made for each applicable test mode based on a comparison of the measured value for HC and CO as described in paragraph (d)(1) of this section with the short test standards contained in § 86.708(a) for light-duty vehicles or in § 86.709(a) for light-duty trucks. A vehicle passes the test mode if any pair of simultaneous values for HC and CO are below or equal to the applicable short test standards.

(e) *Test sequence—general requirements.* The test timer starts only after the requirements described in paragraphs (e) (1) through (4) of this section are met. If these conditions are not met within one minute upon completion of the preconditioning, the CST must be aborted.

(1) The vehicle is tested with the transmission in neutral or park and all accessories turned off. The engine must be at normal operating temperature (as indicated by a temperature gauge, temperature lamp, touch test on the radiator hose, or other visual observation indicating that overheating has not occurred).

(2) The tachometer must be attached to the vehicle in accordance with the analyzer manufacturer's instructions.

(3) The sample probe is inserted into the tailpipe to a minimum depth of 10 inches. If the vehicle's exhaust system prevents insertion to this depth, a tailpipe extension must be used, or the probe may be inserted into the tailpipe to CVS connector through an aperture provided for this purpose.

(4) The measured concentration of CO plus CO₂ must be greater than or equal to six percent.

(f) When the requirements listed in paragraph (e) of this section have been satisfied, the procedure selected by the Administrator from among the emission tests described in § 86.1439 is performed on the test vehicle in accordance with the conditions prescribed in this section and §§ 86.1430 and 86.1432.

(g) If a certification test vehicle fails its initial confirmatory CST, a retest must be given in accordance with the provisions of § 86.091–29(a)(3)(iii)(B)(I) unless the manufacturer withdraws the vehicle from the certification process.

(I) A vehicle receiving a retest must re-enter the confirmatory pathway at either:

(i) The soak time step, as described in § 86.1432, or

(ii) The drain and fill step preceding the soak time option, as described in § 86.1432(b)(1), using the same type of fuel as was used in the initial CST. The vehicle may optionally be filled to the specified level defined in § 86.082 without being drained.

(2) A vehicle receiving a retest must either:

(i) Be maintained in the same ambient temperature range as that specified for the initial confirmatory CST (as described in § 86.1430(c)) from the termination of the initial confirmatory CST throughout the retest, or,

(ii) If the vehicle is exposed to ambient temperatures outside of the specified temperature range, before it enters the wait time it must be given a warmup consisting of a full Urban Dynamometer Driving Schedule procedure at the specified ambient temperature range for the initial CST. The test vehicle will be maintained at the same ambient temperature range as that specified for the initial confirmatory CST from this step throughout the remainder of the retest.

(h) *Multiple CSTs.* The Administrator may elect to conduct more than one type of CST on a test vehicle.

(I) If the Administrator elects to change fuels between one CST and a subsequent CST, the subsequent CST initiates at the drain and fill step described in § 86.1432(b)(1).

(2) If the Administrator elects to utilize the same fuel between one CST and a subsequent CST other than a retest, the Administrator may optionally initiate the subsequent CST at the vehicle soak step specified in § 86.1432(d).

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§ 86.1439 Certification Short Test emission test procedures—EPA.

(a) The portions of the performance warranty test procedures described in part 85, subpart W of this chapter designated as “second-chance” which are analogous to the CST emission test procedures do not apply to the testing performed in accordance with this subpart. The Administrator selects from among the CST emission test procedures listed in paragraphs (b) through (f) of this section, which are incorporated into the vehicle test run at the point described in § 86.1438(f); that is, after the requirements of § 86.1438(e) have been satisfied.

(b) *CST—Two-speed idle test.* This test consists of an idle sampling mode followed immediately by a high-speed sampling mode. The test timer starts (tt=0) when the conditions specified in § 86.1438(e) are met. The overall maximum test time is 290 seconds (tt=290). The test terminates immediately upon reaching the overall maximum test time. A vehicle that has not yielded passing results by the expiration of the overall test time fails the test.

(I) *Idle mode.* (i) The mode timer starts (mt=0) when the vehicle engine speed is between 350 and 1100 rpm. If engine speed exceeds 1100 rpm or falls below 350 rpm, the mode timer resets to zero and resumes timing. The minimum mode time is 30 seconds. The maximum idle mode length is 90 seconds elapsed time (mt=90).

(ii) The pass/fail analysis begins after an elapsed time of ten seconds (mt=10). A pass or fail determination is made for the vehicle and the mode terminated as described in paragraphs (b)(1)(ii) (A) and (B) of this section.

(A) The vehicle passes the idle mode if the measured values are less than or equal to the applicable short test standards as described in § 86.1438(d)(4) prior to an elapsed time of 90 seconds (mt=90). If the vehicle passes, the mode